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ABSTRACT

An instrument was developed to investigate the study behavior of high school students. Based on the Study Behavior Inventory (Bliss and Mueller, 1986), a measure designed to examine the study behaviors of college students, the Study Behavior Inventory-High School Version was developed through the contributions of 10 focus groups of high school teachers who considered the appropriateness of items from the original instrument for a high school population. Students in Social Studies classes from 2 high schools (n=767) participated in studies of validity, and a pilot group of 43 students took the new instrument on 2 different occasions to study reliability. Results suggest that the Study Behavior Inventory-High School Version appears to produce valid, and in most cases, reliable scores when administered to students in grades 9 through 12, although the low reliability of Factor 4 of the scale is of concern, and requires investigation. An appendix contains the instrument. (Contains 15 references.) (SLD)

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An Instrument for the Assessment of Study Behaviors of High School Students

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An Instrument for the Assessment of Study Behaviors of High School Students

Spurred on by moves of federal, state, and local governments in the United States to establish systems of accountability based on high stakes tests for elementary and secondary schools, the use of instruments which assess study skills and behaviors has gained increasing popularity. Some popular instruments include the *Study Attitudes and Methods Survey Revised Short Form* (Michael, Michael, & Zimmerman, 1985), the *Process Skills Rating Scales* (Karnes & Bean, 1990), the *ACT Study Power Assessment and Inventory* (American College Testing, 1989), the *Study Habits Evaluation and Instruction Kit* (SHEIK) (Jackson, Reid, & Cedric, 1979), and the *Learning and Study Strategies Inventory-High School Version* (LASSI-HS) (Weinstein & Palmer, 1990). The first two of these are study skills measures rather than measures of study behaviors or habits. Bliss and Mueller (1987) pointed out the difficulty with using measures of study skills for making instruction decisions.

> The old adage tells us that we can lead a horse to water, but we can't make it drink; likewise we can effectively teach study skills to students, but we cannot necessarily make them apply these skills in the course of their academic careers. Between knowing *how* to study (possessing study skills) and actually *using* these skills in preparing for academic tasks (exhibiting study behaviors) there is a connecting phenomenon which relies on students' feelings about the usefulness of these skills and their attitudes toward their academic endeavors and themselves. This

> phenomenon will probably determine whether study skills will be manifested in study behaviors. (p. 16)

The SHEIK does measure study skills, but it is standardized on a population of New Zealand students and produces scores that may not be interpretable when used by students in schools in the United States. Kiewra (1998) reports certain difficulties in the development process, psychometric properties, and score interpretability. He notes, "Furthermore, SHEIK is neither empirically founded nor empirically tested. There is no evidence demonstrating that students achieve higher in school because of this program" (¶ 12).

The *LASSI-HS* is clearly an instrument designed to measure study behaviors or habits. However, Kiewra (1992) points out that, "No validity data are reported for the LASSI-HS. Without such data it is impossible to know whether the test scores can be interpreted as measures of learning and studying behaviors as intended" (¶ 14). The reviewer concludes,

> At face value, the LASSI-HS contains scales and items that seem to tap important learning and study behaviors. The items are the best I have seen. The lack of psychometric evidence, however, makes its use risky and premature among those demanding assurance about its construction, accuracy, and usefulness. (¶ 15)

Olivárez and Tallent-Runnels (1994) studied the psychometric properties of the LASSI-HS and cast some doubt upon the validity of interpretations of the instrument by noting that, "The Learning and Studies Strategies Inventory for High School is also a complex measurement tool that seems to possess considerable potential for research in the area of

cognition and metacognition, but 10 scales do not appear to represent the structure underlying responses" (p.256). Additionally, there is reason to question the results of this study, since the authors carried out factor analysis on a 76-item instrument using a sample of only 367 subjects. Finally, Everson, Weinstein and Laitusis (2000) reported similar difficulties with the relationship of the factor structure to the 10 scales of the LASSI.

Development of the Study Behavior Inventory – HS

In 1986 Bliss and Mueller presented the *Study Behavior Inventory*, an instrument design to investigate study behaviors of college and university students. The instrument was eventually normed and made available for use by practitioners (see Bliss & Mueller, 1993). The instrument consists of 46 items and reports out both criterion referenced and norm-referenced scores in three subscales derived by examining the underlying structure of the instrument using factor analysis. During the spring of 2001 ten focus groups of high school teachers in a diverse sample of high schools in the South Florida area were convened and asked to judge the appropriateness of the *SBI* items for high school students. The groups were asked to consider both the appropriateness of the items for students in a high school situation and the vocabulary used in the items. They were also encouraged to delete items they felt were inappropriate and suggest additional items. Using the focus group recommendations, the *Study Behavior Inventory – High School Version* was developed.

Methods

Subjects

Two high schools, one drawing its students from a middle and upper socioeconomic status population and the other from a working class population provided participants for this study. Teachers of social studies classes were contacted since all students took a social studies class every semester and these teachers were asked to administer the *SBI-HS* to all students in their classes.

Procedures

Students were instructed to give their names and grade levels and sex on the appropriate place on the instrument. Current grade point averages were obtained from school records. Participants were given all the time they needed to complete the instrument and none took more than 25 minutes.

Results

Validity

Factor analysis. Exploratory factor analysis using a principal components model with a varimax rotation was conducted and this analysis yielded 11 factors with eigenvalues greater than 1.00. A scree plot revealed only four of these on the scree, accounting for 72% of the total variance of the scores on the instrument, so a confirmatory analysis constraining the model to four factors was carried out. Table 1 shows the distribution of the *SBI-HS* items among the four factors and their loadings. An item was considered to be included in a factor if it had a factor loading of at least .30 on one of the four factors with no loading greater than .25 on any other factor. Based on this criterion, all items except item #42 loaded on a unique factor.

Table 1

Study Behavior Inventory-HS Factor Loadings

Factor 1		Factor 2		Factor 3		Factor 4	
Item	Loading	Item	Loading	Item	Loading	Item	Loading
31	.768	29	.602	18	.521	46	.520
30	.705	9	.577	15	.501	43	.479
35	.681	23	.553	16	.469	44	.428
32	.643	7	.552	19	.460	3	-.390
33	.579	11	.538	24	.426	8	-.312
27	.533	28	.536	2	.416		
25	.532	4	.526	20	.377		
41	.520	5	.522	37	.350		
45	.500	36	.515	1	.309		
22	.479	17	.508				
40	.463	39	.483				
38	.460	6	.449				
13	.458	26	.424				
14	.329	10	.424				
21	.305	34	.419				
		12	.387				

Factor 1, consisted of a group of 15 items which accounts for 35.4% of the variance of the scores on the *SBI-HS*. As in the higher education *SBI*, these items deal with academic self-perception and feelings of low self-esteem and security about the student's ability to accomplish academic tasks. This factor includes such items as, "I have to go over written materials several times. The words don't have much meaning the first time I go over them" and "I get nervous and confused when taking tests. Because of this I don't answer the questions as well as I could have." Another of the items loading on this factor is, "When tests are returned, I find my grade has been lowered because I made careless mistakes."

Factor 2, which included 16 items and accounted for 20.3% of the total variance of the inventory scores contained items that assessed academic preparation behaviors.

These behaviors included those that students performed in preparation for and during the carrying out of academic tasks. Among these items were, "When I begin to study I organize things I have to do so that I can use my time in the best way possible", "When preparing for a test I study material in some logical order such as the order it was presented in class, the order of importance with the most important material first, or the order of the material in time such as the oldest to the most recent" and "I plan the answers to essay questions in my mind before I start writing them."

Factor 3, which contained 10 items accounting for 8.6% of the total inventory variance, contained items that were concerned with the management of time. Among these items were, "I watch too much television and/or play too many video games and this interferes with my studies", "I skip over and don't pay attention to charts, graphs, and tables when reading an assignment" and "I wait until the last minute to write term papers and reports."

Factor 4 was made up of five items that accounted for 7.7% of the total variance of the *SBI-HS*. These items dealt with the social nature of studying and of taking tests. Items in this factor included, "For some subjects, I like to study with others" and "I think I could do much better on tests if I could take them alone rather than with a group of other students." This factor was totally absent from the higher education level of the *Study Behavior Inventory* although it was hinted at in the Spanish version (Bliss, Vinay, & Koeninger, 1996) where a fourth factor contained two items dealing with studying alone or with others. Table 2 presents the correlations of these four factors.

Table 2

Correlations Between Factors of the SBI-HS

Factor	1	2	3	4
1. Academic self-esteem	—	.202	.341	.064
2. Academic preparation		—	.327	- 114
3. Time management			—	.138
4. Social nature of studying				—

These correlations show good levels of independence between the factors.

Relationships with other variables. There were no significant differences between the scores of boys and girls on the total score of the *Study Behavior Inventory-HS* or on any of the four factors. Table 3 shows the results of t-test comparing the scores of the two sexes.

Table 3

SBI-HS Total and Factor Scores Broken Down by Sex

	Males (n=384)		Females (n=383)				
	Mean	SD	Mean	SD	t	df	p
Factor 1	44.2	8.4	45.1	7.9	-1.515	765	.130
Factor 2	41.8	9.0	42.5	8.1	-1.145	765	.253
Factor 3	29.2	5.3	29.4	5.0	-.667	765	.505
Factor 4	12.1	2.7	12.3	2.7	-1.129	765	.259
Total	127.16	17.3	129.2	15.8	-1.721	765	.086

The correlations between students' cumulative grade point averages and their scores on each of the factors and their total *SBI-HS* scores were .84, .79, .76, .75 and .85, respectively.

Reliability

A pilot group of 43 students in grades 9 – 12 were administered the *SBI*-HS and readministered the instrument after 61 days. The correlations between the two administrations for each of the four factors and for the entire instrument were .85, .80, .76, .65, and .85, respectively. Cronbach's alpha for the four factors of the *study Behavior Inventory-HS* and for the entire instrument were .84, .81, .62, .25, and .84, respectively.

Conclusions and Discussion

The *Study Behavior Inventory – High School Version* appears to produce valid and, in most cases, reliable scores when administered to students in grades 9 through 12. The low reliability on Factor 4 (α = .25) is of concern and needs to be carefully investigated. The small number of items (only five) in this factor very likely contributes to this low level of reliability, but is unlikely to be the sole cause of the phenomenon.

Also troubling is the failure of item #42, "I believe that grades are based on a student's ability to memorize facts rather than on the student's ability to 'think things through'" to load satisfactorily on any of the four factors. Nor does it fit theoretically into any of the factors. While this item was useful in the higher education version of the *Study Behavior Inventory*, it does not appear to be useful in this secondary school version and should probably be removed from the instrument.

The intercorrelations of Factor 3 with Factors 1 and 2 should be looked at seriously. These values (r = .341 and .327, respectively), while not unacceptably high, are on the borderline of comfortability. The factors should, theoretically, be independent of each other.

The Factor Structure

The first factor derived from the *SBI-HS* is virtually identical in the first factor in the higher education *Study Behavior Inventory*. Bliss and Mueller (1993, 1978) cite phenomenologist psychologists (for example Combs & Snygg,1959 and Rogers, 1961) in explaining the theoretical connection between feelings of self-efficacy and study behaviors

The second factor, composed of activities involving academic tasks, is very similar to the "Cognitive activities" factor found in the *LASSI-HS* by Olivárez and Tallent-Runnels (1994).

The third factor, composed of time management behaviors appears to be a combination of the two time management factors found in the higher education level of the *SBI*. While the higher education version factor structure distinguished between time management for routine, every day academic tasks and long-range, unique academic tasks, the high school version factor structure does not make this distinction.

Finally, Factor 4 is interesting since it was hinted at in a validation study of the Spanish version of the higher education version (Bliss, Vinay, & Koeninger, 1996). In that study a fourth factor was obtained, which contained two of the items in the present Factor 4 that dealt with preference for studying either alone or with other students and added three other items dealing with physical conditions during test taking and studying for high stakes tests.

Future Work on the SBI-HS

The *Study Behavior Inventory-High School Version* needs to be revised on the basis of the information revealed by this study. There is need to look at the low level of reliability

obtained on the fourth factor. In addition, this factor structure needs to be cross validated and the stability of the factor structure and its concurrent validity with grade point averages needs to be established across grades and sexes of students. Finally, the instrument must be normed using a sample representative of the U.S. national population of high school students.

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Appendix

THE STUDY BEHAVIOR INVENTORY – FORM HS

Leonard B. Bliss

This survey is designed to find out what study habits you have developed at this stage of your life. Knowing the results of this inventory can help students develop better and more productive ways to study and help teachers do a better job of teaching.

All the information in this survey will be kept in strictest confidence, so please be up front and honest in your answers.

The following is a list of statements of habits and attitudes that may affect use of study time and success in schoolwork and study. Please tell us how you behave concerning each of the 46 statements that follow. Do <u>not</u> answer according to what you think you <u>should</u> do or should not do, but according to what you yourself are in the <u>habit of doing</u>. Please answer <u>all</u> 46 questions.

After each statement, you will find columns A, B, C, and D. Mark each item by checking (√) the space in column A, B, C, or D – whichever best describes your behavior. Check each item using the following key:

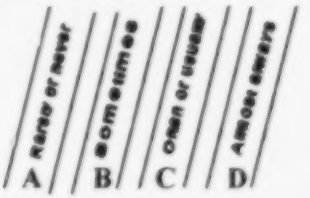
Column A: Rarely or never true in my case
Column B: Sometimes true in my case
Column C: Often or usually true in my case
Column D: Always or almost always true in my case

	A	B	C	D
1. I don't use my time well. I spend too much time on some things and not enough on others	___	___	___	___
2. I find it hard to finish work by an assigned time. The work I turn in is often incomplete, poorly done, and handed in late	___	___	___	___
3. For some subjects, I like to study with others	___	___	___	___
4. I complete and turn in my homework on time	___	___	___	___
5. I try to use what I learn in one subject to help me in other subjects	___	___	___	___
6. I copy drawings and tables that the teacher puts on the board during class	___	___	___	___
7. I keep my work in school up-to-date by doing my work regularly every day	___	___	___	___

Column A: Rarely or never true in my case
Column B: Sometimes true in my case
Column C: Often or usually true in my case
Column D: Always or almost always true in my case

	A	B	C	D
8. I prefer to study alone rather than with other people	___	___	___	___
9. When I begin to study I organize the things I have to do so that I can use my time in the best way possible	___	___	___	___
10. When I am having trouble in a subject I try to meet with the teacher to talk over the problem	___	___	___	___
11. Before I begin to work on term papers and reports I make sure that I clearly understand what the teacher wants before beginning to work	___	___	___	___
12. When I fall behind in my schoolwork I make up assignments without the teacher having to mention it to me	___	___	___	___
13. Difficulties in putting things down in writing slows me down on reports, essay tests and other work that I have to turn in	___	___	___	___
14. My teachers say my written work is rushed and poorly organized	___	___	___	___
15. I put aside returned tests, homework, and reports without bothering to correct errors that the teacher noted in them	___	___	___	___
16. I don't plan my study time very well	___	___	___	___
17. I try to study so that I will understand the material, not just memorize the facts	___	___	___	___
18. I wait until the last minute to write term papers and reports	___	___	___	___
19. I watch too much television and/or play too many video games and this interferes with my studies	___	___	___	___
20. I have trouble finding enough time to study because I have an after-school job that takes up too much of my time	___	___	___	___

Column A: Rarely or never true in my case.
Column B: Sometimes true in my case.
Column C: Often or usually true in my case.
Column D: Always or almost always true in my case



21. Personal problems with my family make it hard for me to concentrate on my studies ..... ___ ___ ___ ___

22. I have to go over written materials several times. The words don't have much meaning the first time I go over them ..... ___ ___ ___ ___

23. I try to connect the things I learn in each class with the things I learned in the class on previous days ..... ___ ___ ___ ___

24. I skip over and don't pay attention to charts, graphs, and tables when reading an assignment ..... ___ ___ ___ ___

25. After I read several pages of an assignment, I can't remember what I read ..... ___ ___ ___ ___

26. When I read a long assignment in my textbook, I stop at times to review the main points in the material that I just read ..... ___ ___ ___ ___

27. When I take notes during class I have trouble picking out the things that are important. I write down things that turn out not to be very important ..... ___ ___ ___ ___

28. I keep all my material for each subject together and arranged neatly in some logical order ..... ___ ___ ___ ___

29. I prepare for each class session by doing the assignments from the previous meeting of the class ..... ___ ___ ___ ___

30. I get nervous and confused when taking tests. Because of this I don't answer the questions as well as I could have ..... ___ ___ ___ ___

31. I find it hard to think clearly when I am faced with a test. Because of this problem I do poorly on tests ..... ___ ___ ___ ___

32. I find it hard to pick out important material in reading assignments that will later appear on tests ..... ___ ___ ___ ___

33. I change answers on multiple choice tests when I actually had the right answer the first time ..... ___ ___ ___ ___

34. I plan the answers to essay questions in my mind before I start writing them ..... ___ ___ ___ ___

Column A: Rarely or never true in my case
Column B: Sometimes true in my case
Column C: Often or usually true in my case
Column D: Always or almost always true in my case

	A	B	C	D
35. I find it difficult to plan my work when I am faced with a test. Because of this I end up doing poorly on tests	___	___	___	___
36. When preparing for a test I study the material in some logical order such as the order it was presented in class, the order of importance with the most important material first, or the order of the material in time such as the oldest to the most recent	___	___	___	___
37. I am careless with spelling and grammar when answering essay questions	___	___	___	___
38. Although I work until the last possible moment, I run out of time before I finish tests	___	___	___	___
39. If I have time, I check my answers before turning in my test paper	___	___	___	___
40. When tests are returned, I find my grade has been lowered because I made careless mistakes	___	___	___	___
41. During a test I forget names, dates and other details that I really do know	___	___	___	___
42. I believe that grades are based on a student's ability to memorize facts rather than on the student's ability to "think things through"	___	___	___	___
43. I study harder for end of year tests (such as final examinations) than for the rest of my schoolwork	___	___	___	___
44. I think I could do much better on tests if I could take them alone rather than with a group of other students	___	___	___	___
45. Worry about how well I will do interferes with my studying and my performance on tests	___	___	___	___
46. I think I could do much better on tests if I could take all the time I needed and not feel pressured by a time limit	___	___	___	___

(END OF SURVEY)